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THE PRICE PROBLEM IN THE LUMBER INDUSTRY

Many of the most important issues with respect to the prices of the basic raw materials of industry and to the wise control of natural resources generally are exemplified in the lumber industry. These are live subjects. Competition in many American industries has been virtually suspended under the war conditions. To the problem of prices is therefore added the problem of adequate control. Professor Stephens' interesting article in the AMERICAN ECONOMIC REVIEW¹ is timely. So pointed is the analysis of price determinants that one wishes that the more complete facts concerning the price situation which the writer has there depicted might have been in his possession.

So complex is the lumber price mechanism that it defies brevity in its analysis. The sins of over-capitalization, the perils of borrowed capital sunk in a speculative enterprise, the consequences of an exceptional degree of decentralization are all to be considered. Influences peculiar to natural resources as a class are present; still others peculiar to standing timber alone. With them all are the general influences affecting the prices of all commodities in the same direction and tending, other things being constant, in the long run, to affect them equally.

The isolation of the specific effects of specific influences, difficult at best under the most simple conditions, is many times more difficult in the analysis of lumber prices. To this end Professor Stephens' article is illuminating. It is essentially a review of the present writer's book on *The Organization of the Lumber Industry*.² In this book attention is directed to the price problems fundamental in the consideration of public policy with respect to standing timber, and a convenient method of price analysis is outlined. But Professor Stephens' flattering estimate of it does not perhaps indicate adequately that reasonably close approximations are the best that may be expected. In abstracting from the total movement of lumber prices that proportion which has been due either to influences peculiar to lumber or to general influences operative upon lumber prices to an unusual degree, no modest assumption with respect to *facts* is required. The assumption that the total movement of lumber prices over a given period, in so far as it has been, in respect both to direction and relative amount,

¹ G. A. Stephens, "Determinants of Lumber Prices," THE AMERICAN ECONOMIC REVIEW, vol. VII, no. 2 (June, 1917), pp. 289-305.

² Chicago: American Lumberman. 1916. Pp. x, 153.

the same as the movement of general prices, has been due to *general* influences affecting all commodity prices and not to specific influences affecting lumber only, is proper food for the analysis to which Professor Stephens has subjected it. This assumption has the merit of a convenient working basis as closely corresponding to the facts as available information will allow. Although Professor Stephens in his review has not distinguished between a working assumption and a statement of fact, the present writer and the student of the lumber industry may be grateful to him for the added proof his careful analysis gives of the essential correctness of the basic assumption of the book with respect to general price influences in their relation to lumber prices. This is the more for the reason that the same method and the same assumption may be used and is now being used by public agencies in the study of other natural resources.

The recent article is illuminating with respect to many important aspects of lumber price fixation. But many significant facts appear to have been overlooked and others apparently misconstrued. The present writer, although desiring to promote a complete and accurate statement of an instructive price situation, is nevertheless not disposed to enter a controversial field where, in the absence of facts, opinion is balanced against opinion. The brief space available for this purpose admits of but the most meager exposition. Many matters must therefore remain untouched.

I

The lumber manufacturing industry has long had the attention and study of public agencies. The chief public interest attaches to it as the virtual administrator of the nation's resources of standing timber. From unhealthy competitive conditions, largely the result of defective organization and unwise financing of investments, the industry first sought self-relief through trade agreements, formal or informal, and under varying guise. But this search was comparatively fruitless and was discouraged from within and repressed from without. Since 1907, with the exception of the past few months when under war conditions a shortage of labor and of transportation facilities has caused a virtual suspension of competition in the sale of lumber in many regions of the United States,³ the lumber industry has shared but little in the

³ The production at the mills has apparently not declined substantially if at all. But a considerable proportion of the output is not reaching the market

general increase in prices. The highest prices during this ten-year period were in the second quarter of 1907, the first quarter of 1913, and the first quarter of 1916. The lowest prices occurred during the second quarter of 1908 and the second quarter of 1915.

A comparison of these extremes of price in percentages of a base price of 100, which is the average price for the first three quarters of 1907, is shown in the following table.⁴ The species included constitute nearly 90 per cent of the annual cut of softwood lumber. Hardwoods are not included. They are relatively much less important and the prices of them present in large part a separate problem.

RELATIVE PRICES OF LUMBER BETWEEN 1907 AND 1916
Basis: F. O. B. Mill.

Species	Year	1907	1908	1913	1915	1916
	Quarter	2	2	1	2	1
Southern Yellow Pine		103.4	58.0	107.3	78.2	108.9
North Carolina Pine		102.3	88.1	127.3	95.9	115.8
Douglas Fir		101.3	77.3	89.7	58.6	86.8
Northern Pine		100.9	94.6	104.9	99.9	103.4
Hemlock		102.1	77.2	104.1	89.6	101.2
Cypress		100.4	89.2	97.7	91.2	(²)
Western White Pine	(¹)	(¹)	(¹)	107.3	102.8	110.7
Western Yellow Pine	(¹)	(¹)	(¹)	100.8	85.7	96.0

¹ Prices not available for period prior to second quarter of 1909. For this quarter the relative price of Douglas fir is used for both species of western pine, namely, 81.6.

² Prices not available.

During the same period general commodity prices,⁵ on a base similarly computed, moved as follows:

	1907	1908	1913	1915	1916
General prices	100.	97.8	106.7	107.5	132.8

where it may come into touch with, and be balanced against, the demand. The present prices are therefore in a measure fictitious. When normal transportation conditions reassert themselves this situation will doubtless disappear.

⁴ These relative prices are based on a representative average for each species of prices of actual sales of lumber by identical mills throughout the period or by mills in substantially similar situation in the same region.

⁵ Adapted from Index of Relative Prices of Bureau of Labor Statistics.

Lumber prices, it is apparent, have greatly lagged behind general prices during this period. At the same time the proportion of the total output of lumber which has been cut in each lumbering region has remained practically constant, *i.e.*, about 24 per cent in the Pacific States and Montana and Idaho, including chiefly Douglas fir and the western pines; about 45 per cent in the Southern States, including chiefly southern yellow pine, North Carolina pine and cypress; about 15 per cent in the Lake States and the Eastern States, including chiefly northern pine and hemlock. The remainder of the output is almost exclusively hardwood in the central hardwood region. It is obvious, therefore, that the most important facts with respect to lumber prices concern the softwoods of the South and the West. These two groups of softwoods, moreover, constitute more than two-thirds of the total supply of merchantable standing timber of all species in the United States.

To complete the preliminary picture of the lumber price situation it is necessary to compare the facts above shown with those of the period preceding 1907. General commodity prices in terms of gold dollars in 1900 were approximately the same as they had been in 1860. But during the intervening period the average prices of lumber, at the mill, increased more than 150 per cent. Lumber was becoming a much more important article of interstate commerce and the markets secured their lumber supplies from mills increasingly distant. Between 1890 and 1907 general prices increased 14.6 per cent and lumber prices 94 per cent. The outstanding facts, therefore, of the period prior to 1907⁶ are: (1) The great increase in lumber prices as compared to general prices, and (2) the constantly increasing proportion of the lumber output which was manufactured in the regions most distant from the chief consuming centers. Contrasted with these are the analogous facts for the period since 1907, namely: (1) The substantial decline in lumber prices as compared to general prices, and (2) the almost uniform relation maintained between the quantities of lumber produced in the different regions.

⁶The year 1907 marks the point of maximum total production of lumber in the history of the lumber industry in the United States, *i.e.*, 46 billion feet as against approximately 440 billion feet in 1916. Increasing substitution of other commodities for lumber, replacing within the last 10 years the equivalent for nearly 8 billion feet of lumber, is one of the main causes underlying the recent decline in the demand for lumber. But on the other hand the high prices for lumber prevailing before 1907 were probably chiefly responsible for the increased substitution.

II

The panic of 1907 was followed by a severe reaction in lumber prices, as has been shown in the table above. To a substantial degree the ordinary demand for softwood lumber is a joint demand. The activity of this demand depends in large measure upon industrial activity generally. As Professor J. M. Clark⁷ has recently pointed out, the changes in the demand for finished products are reflected back to more extreme and more sudden variations in the demand for the "means of production" of such finished products. The case of structural lumber is an illustration in point. The great temporary fluctuations in lumber prices, such as have been shown, are not therefore without substantial explanation.

In view of the following facts, the statement by Professor Stephens that "The demand for lumber is unusually elastic, quickly responding to changes in both price and industrial conditions"⁸ requires consideration from an angle different from that from which he has approached it. The joint character of a great part of the demand for lumber has apparently been overlooked. To say that the demand for lumber is quickly responsive to changes in industrial conditions means that the demand for lumber responds quickly to changes in the demand for those commodities to the production of which the lumber is only a single intermediate instrumentality. But such responsiveness is by no means indicative of an elastic demand for lumber. When, for example, factory products are in great demand, structural lumber is likewise in demand for factories and repairs. And this is true in large measure irrespective of the price of the lumber. To the extent to which the demand for lumber is a joint demand it is not responsive to changes in price and as compared to the demand for commodities generally it is inelastic, not elastic.

This fact is recognized throughout the lumber trade and is one of the greatest causes of perplexity to the lumber manufacturer or dealer in his effort to maintain stable prices with a reasonably uniform volume of sales. The present writer has been repeatedly told by manufacturers, especially by dealers, and, with respect to certain important classes of trade, "I cannot sell a stick more by reducing my prices and I sell just as much by keeping my prices up." Such expression, although doubtless an exaggeration, is

⁷ Business Acceleration and the Law of Demand: A Technical Factor in Economic Cycles, *Journal of Political Economy*, March, 1917.

⁸ Stephens, *loc. cit.*, p. 304.

significant of the basic fact in the experience of the industry. Were the demand for lumber elastic, one of the most troublesome faults in the organization of lumber distribution could be corrected.

But the inelasticity of the demand for lumber is not confined to the field of joint demand (although the line of demarcation of that field is difficult to draw). Many of the most prominent southern lumbermen have asserted to the present writer that if they could only reduce by 2 per cent the average yearly cut of southern yellow pine lumber, year in and year out, they could prevent the extreme fluctuations in prices such as those depicted in the above table. This, if true, means that decreases as great as 30 per cent in the average price could have been counteracted by a 2 per cent decrease in stocks. Numerous facts tend to confirm this contention in substance, although the proportionate decrease in stocks required may perhaps have been underestimated by overzealous advocates of a particular remedy for the disease of the industry. But during 1915, in a single marketing territory in the Southwest, an increase accumulated in yard stocks of but little more than 1 per cent was accompanied by a decline of more than 10 per cent in price. Similar instances have been noted. They are not conclusive of inelasticity of demand. But they are confirmatory evidence of it.

Between the second quarter of 1907 and the second quarter of 1908 softwood lumber prices generally fell almost 40 per cent. General prices fell less than one-half as much. The production of lumber likewise declined during the period more than 10 per cent. But despite the great proportionate curtailment of lumber output of the entire country a recession in price of 45 per cent in the case of southern yellow pine and of nearly 30 per cent in the case of Douglas fir was necessary to enable the market to absorb the offered stocks. Such characteristics are not those of a commodity for which the demand is highly elastic. It is to be noted, moreover, that the heaviest buying recorded in the lumber industry occurred from 1905 to 1907, during which the prices of softwood structural lumber increased nearly 50 per cent on an f. o. b. mill basis. During the same period there was almost unprecedented industrial activity generally.

III

But another important factor is to be noted in relation to the demand for lumber, namely, the changes in the national habit of

inordinate lumber consumption. This may be illustrated by the following comparison of the per capita utilization of lumber in representative states and foreign countries in feet, board measure:

Montana (1915)	1,234	Germany (1913)	150
Oregon (1915)	714	England (1914)	102
Pennsylvania (1915)	293	France (1914)	90
New York (1915)	206	Canada (1909)	468
United States (1915)	375	United States (1909)	485

This indicates, with respect to the United States a relatively heavy demand in the early stages of development (as exemplified by Montana) for lumber largely, it may be assumed, for structural purposes or for other uses requiring chiefly rough lumber. With the filling up of the "silent places" of the West and with the more gradual subsequent agricultural and industrial development (as exemplified in Pennsylvania or New York) the relative demand for lumber for the uses which formerly were the most important has much declined.

An increasing proportion of the new demand for lumber now being developed by the organized trade extension campaigns of lumber manufacturers is for stock requiring a greater average degree of refinement and a greater specialization of manufacture. Specialties are in growing demand. It is possible that with respect to these the demand is more elastic, a decline in price stimulating a greater than proportionate increase in buying. But this feature characterizes only a small part of the total lumber situation and is confined in large part to hardwoods. The great bulk of soft-wood structural lumber still encounters a relatively inelastic demand. A slight relative overproduction regularly has resulted in a great decline in price. This fundamental characteristic of lumber prices is one of the most decisive factors to be considered in the determination of a public policy whereby a stable condition of the lumber industry may be maintained.

IV

As bearing again upon the principles of lumber price fixation by the ordinary forces of the market, the following statement on cost and prices calls for consideration:

So preponderant, indeed [about 80 per cent], is the wage factor in lumber manufacturing, that were other factors in all industries to remain stationary and labor costs to increase in like percentages, total costs would increase relatively more in lumber manufacturing than in

the average of other industries, *resulting, other things equal, in relatively higher prices.*⁹

The actual proportion of the wages item in manufacturing cost is much less than is often asserted by lumbermen. Usually inadequate depreciation or none at all has been charged to cost in the manufacture of lumber. Frequently general expenses are not added, and the "manufacturing cost" spoken of often includes only the *specific costs* of the logging, milling and yarding operations. But the "overhead" in lumber manufacture is relatively large, and in the use of powerful labor-replacing machinery the actual "depreciation" is heavy.

The labor element, although preponderant, is generally much less than 80 per cent of the total cost. For example, the proportion of wages in total cost of operation only (*i.e.*, including no charge for the standing timber used), from stump to mill yard, for several representative mills in important regions, was as follows:

Southern yellow pine region (1914)—for 62 mills, 56 per cent.
Douglas fir region, Pacific Northwest (1913)—for 8 mills, 51 per cent.

Inland Empire—Idaho, Eastern Washington and Oregon (1914)—
for 22 mills, 50 per cent.

California redwood region (1914)—for 11 mills, 47 per cent.

The lumber industry is the largest employer of labor in the United States, but the relative importance of the wages element in costs has been often exaggerated. More important, however, in the excerpt quoted above is the statement that "were other factors in all industries to remain stationary and labor costs to increase in like percentages," this situation would result in relatively higher prices for lumber. Such a situation has frequently existed in parts in the lumber industry without this result. Sharp competition between different manufacturing regions frequently, if not usually, in normal times has prevented any corresponding increase in lumber prices to compensate for the increase in labor cost. Allowing for differences in the efficiency of the average wage-earner in the lumber industry, the increase in labor cost since 1890 has been not less than 60 per cent in the woods and not less than 50 per cent in the mill per thousand feet of lumber produced.

Up to about 1907 the steadily increasing relative demand for lumber made possible the shift to the consumer of much more than the average increase in labor costs. But from 1907 to 1916, as we

⁹ Stephens, *loc. cit.*, 290. Italicics are mine.

have seen, lumber prices generally did not show a net increase. Nevertheless, labor costs per unit and total manufacturing cost substantially increased. In recent years these have increased rapidly. The general result of this situation was for a few years a decline in the manufacturing profits as such. But beginning in the latter part of 1913 the standing timber, the raw material of lumber manufacture, began to share more heavily in the effect of the almost steady decline in the margin between cost and selling price. The prices of standing timber began to decline for the first time in the history of the lumber industry. Timber owners having hundreds of millions of dollars invested in standing timber found the stumpage market dull and unreceptive. Timber investments came into comparative disfavor among bankers and investment houses because lumber prices were no longer rising and because conversion into lumber was the sole means of liquidating such investments.

Haste to liquidate an unpromising investment was thus only stimulated. This resulted in still greater relative overproduction, and by the middle of 1915 lumber prices generally were almost as low as they had been after the panic of 1907. Seeing the profitableness of the great investments in raw materials threatened, and a more wasteful use of standing timber impending, a vigorous appeal was made to the government to provide some practicable method whereby, consistent with the public interest, production could be controlled, the undue waste of natural resources prevented, and the investments in standing timber protected.

How is this chain of events to be correlated with the connection above stated¹⁰ to exist between labor costs and lumber prices?

¹⁰ Stephens, p. 290; see p. 588 above. The same assertion from a slightly altered angle is made, *ibid.*, p. 291:

"Wages in the lumber industry increasing at approximately the same rate as general wages, efficiency of labor declining, and the wage cost proportionately larger than in other industries—such a complex should constitute a material cause for the relative increase in lumber prices." (Italics are mine.)

In addition to the doubtful relation stated between cost and price is here to be noted the fact that during nearly ten years since the panic of 1907 there has been no relative increase in lumber prices but, on the contrary, a relative decrease despite a substantial increase in the labor cost per thousand feet of lumber. The situation prior to this period is adequately explained, on the supply side (which is here under review), by the relative exhaustion of nearby timber, by rapid increases in the average distance from the market of the main sources of lumber supply, and by the changes caused thereby in conditions of competition between regions. (See Compton, *The Organization of the Lumber Industry*, p. 113.)

Have the increasing labor costs, all other things being equal, resulted in higher lumber prices? It is true that the condition proposed, namely, that other things be equal, is not to be found in the study of economic relations in industry. The equality of other conditions must therefore be assumed. The merits of this assumption have been already discussed. Obviously, if this assumption be made, the increased labor cost in lumber manufacture has been at the expense either of (1) the consumer, in higher prices, or (2) the manufacturer, in smaller operating profits, or (3) the owner of timber, in a decreased realization upon his stumpage. The facts shown above with respect to lumber prices are indicative that during the entire period since 1907 there has been, generally speaking, no increase in prices.¹¹ During the same period operating profits have declined and likewise the realization on stumpage.

That these increases in cost have been at the expense of the investments fixed in operating plant and in raw material, and not at the expense of the public, is one of the most important features of the present situation in the industry. It is indeed the central objective fact wherein lies, in large part, the crucial public question as to the conservative use of the nation's standing timber. Unprofitable industry and conservation are incompatible in practice. If increased costs cannot be shifted, the investment, the profitableness of which is thus circumscribed, naturally becomes relatively unattractive, and the owner may be expected to liquidate his investment in favor of a more profitable enterprise as fast as the price of lumber will permit. Such pressure for early conversion of standing timber has caused much waste.

V

It is the chief remaining task of this paper to explain why, under conditions that have existed in the lumber industry, increased

¹¹ It is to be noted that the recent increase under abnormal circumstances is not included in this statement. This increase beginning about November, 1916, has been due primarily to an acute car shortage. Competition in the sale of lumber has been virtually suspended in many parts of the country. For example, certain grades of southern pine have recently (June) been sold on an f. o. b. mill basis of \$25 per thousand feet. At the same time other manufacturers less advantageously situated with respect to present shipping facilities, although normally experiencing no trouble, are offering similar stock at \$15 to \$17 per thousand feet *at the mill* to any one who will himself provide shipping facilities therefor. Price fixation under such conditions has no connection with the cost of manufacture.

costs generally have not been shifted. The standing timber, a raw material limited in supply, has been in the long run the all-absorbent of all special *advantages* with respect to price. It is likewise the ultimate resting place of the effects of the special *disadvantages* peculiar to the lumber industry. This is not an unfamiliar phenomenon in industry, but rather the contrary.

This situation is easily explained. Stumpage, labor, working capital in the broad sense, and the agent discharging the enterpriser's function, however it be designated, are the productive agents coöperating in the production of lumber. The wages of labor (since generally speaking no special initial skill is required), the return to the working capital and the reward to the enterpriser are in the long run fixed by competition between industries, and under similar conditions these shares cannot for a long period greatly vary as between such industries competing for labor, capital, and enterpriser's skill. The value of steel equipment, for example, depends only in very small part upon the use of steel equipment in lumbering operations. But the standing timber has virtually no commercial value except to the extent to which it shares in the price paid for the lumber products into which it is converted. Furthermore, the physical amount of standing timber, which is a natural resource, does not depend upon its price. Still more important, the *effective supply* of timber, *i.e.*, the quantity of timber actually offered for conversion into lumber at any time, is now and for a considerable time in the future will be virtually independent of the price which may be secured for it.

What is the reason for this apparent contravention of economic principle? In part the condition has been a consequence of the arrant speculation characteristic, until recent years, of timber investments, resulting in much over-capitalization of timber holdings. Obviously, whether the price be high or low, the timber sooner or later will be proffered for conversion into boards. As will be shown later, the existing conditions in timber holding are forcing and promise so to continue to force timber upon the market currently, irrespective, in large measure, of the desire to withhold on the part of the owner, and within certain limits irrespective of the price of lumber. The other items of cost derive their market value from several sources. But standing timber derives its value in the last analysis only from the value of the lumber into which it may be converted. Standing timber, the beneficiary in the long run of unusual prosperity in the lumber industry, is likewise the

victim of the industry's adversity. This is why the success of forest conservation in the United States is dependent fundamentally upon the prices of lumber.

VI

There are many other generalizations in Professor Stephens' article to which I would give greater consideration if space permitted. Some of these are matters of opinion. They can be settled only by facts which, on many points raised, are not available. To attempt to find in the lumber industry as now organized the concrete illustration of simple principles of economic action is at best to encounter serious obstacles. The chain of expected sequences is frequently broken because of some defect in the organization of the industry itself. The presence of such defects constitutes the basic challenge to wise public policy in the administration of the nation's natural resources. Were they not present, the most difficult problems would vanish. To squint at them or to evade them is at the expense of a complete and fair picture of the industrial situation. But such completeness cannot be achieved within the brief compass of this paper.

It may be seriously questioned whether, as a matter of fact, concentrated or decentralized ownership of standing timber under certain existing conditions has had the greater tendency to cause actual withholding of timber from the market or from the saw. It is admitted by Professor Stephens¹² that "It is only as it [concentration] affects withholding [of timber], that it becomes a price-determining factor."

It is of course true that concentration of ownership makes monopoly more possible than does decentralized holding. On the other hand, the difference must be observed between present withholding of timber such as would arbitrarily affect present prices and concentration of holding such as may in the future develop into a substantial restraint provided certain conditions shall then exist. Moreover, concentration is a question of degree, and what is considered concentration in the holding of timber would not be so considered in many other industries. What is now probably the largest private holding of timber in the United States is that of the Weyerhaeuser Timber Company, situated mostly in the State of Washington. There are also other large, but smaller holdings. The total standing timber in the state in 1916 was approximately

¹² *Loc. cit.*, p. 296.

375 billion feet, which was being cut at the rate of nearly 1.2 per cent each year. Large holdings are, with the possible exception of California, more characteristic of the state of Washington than of any other state in the Pacific Northwest, where stands more than half of the total remaining timber of the United States.

In the adjacent state of Oregon there are approximately 530 billion feet of standing timber. But there are more than 24,000 individual holdings and only a relatively small number of large ownerships. The average quantity of timber in each holding is therefore but little more than 20 million feet, and a large proportion of these holdings are not compact. On the contrary, different tracts hundred of miles apart may be found in common ownership. Here is a case of decentralized holding by individuals most of whom are not lumbermen or financiers but lawyers, school teachers, and preachers who had been induced to "speculate a little." Oregon timber is generally of the same species as Washington timber, and is held by many competent wood technologists to be of even superior quality. But the timber is being converted into lumber at a rate of only .4 per cent each year, or only one-third as rapidly as the timber in the state of Washington.

Undue concentration, to be sure, "squints in the direction of monopoly," but whether concentration is or is not "undue" depends in considerable degree on the relation of the size, location, and compactness of the holding to the needs of economical operation in lumber manufacture. As a rule, in the Pacific Northwest the maximum of economy in manufacture has been secured by mills cutting from 25 to 40 million feet of lumber per annum. And the most economical lifetime of the average operation is about 20 years. If 25 million feet be taken as the minimum capacity of efficient mills, the average timber holding in Oregon constitutes less than a single year's supply. Furthermore, it may not be compact.

The great Weyerhaeuser Timber Company holding, on the other hand, is supplying the raw material not only to the two large sawmills of its affiliated Weyerhaeuser Lumber Company, but in whole or in part also to nearly a score of other lumbering operations in the state of Washington alone.

These two cases mark the extremes of decentralization and concentration respectively. The small holdings in Oregon under present conditions are much more a cause of actual restraint than is the Weyerhaeuser holding. The former cannot support an operation. Because of the general overcapitalization of standing timber

and of the failure to materialize of the overconfident hopes of many timber owners, both large and small, the demand for stumpage has much lessened, and the average price, as attested by current transfers, declined about 10 per cent between 1913 and 1916. Under these conditions the small owners of timber in Oregon who cannot manufacture at a profit on their own holding also cannot sell out to timber speculators because the speculative demand for timber has almost disappeared. Furthermore, the annual producing capacity already installed in the United States for the manufacture of lumber is nearly two and one half times as great as the largest output ever recorded. To install new mills on these small holdings would only add to the constant threat of overproduction and increase the degree of idleness of the sawmills taken as a whole. So these small holders cannot sell to actual operators either, since the operating capacity is already so much in excess of the need of the industry. These small holdings, therefore, in the present nature of things, cannot be sold (unless at a financial sacrifice disproportionately great). They cannot profitably be converted into lumber, because of the superior efficiency of the larger operations. They cannot be pooled into compact groups convenient and practicable for operating purposes, both because the law interposes obstacles and because of the vicarious nature of most of the ownerships. Under these conditions the withholding of timber is inevitable although unwilling.

Meanwhile many of the larger holdings also are being withheld from the market and from the saw in the manner described by Professor Stephens.¹³ This is especially true in California, where there are only 22 milling plants steadily sawing redwood. These have had a total output during each of the past five years of less than 500 million feet, but the total amount of merchantable red-wood timber in private ownership is nearly 100 billion feet. Hundreds of holdings, many of them large, are as yet unoperated. The same situation prevails in many other lumbering regions. On the other hand, many of the largest holdings are the ones that are contributing the greatest proportionate amount to current manufacture. Some of them are being divided and compacted according to the needs of efficient operation.

The ownership of standing timber, which was formerly the chief source of profit to the lumber industry, has in a large measure, at least in the Pacific Northwest, become substantially an industrial

¹³ *Loc. cit.*, pp. 296, 297.

burden. Private ownership undertook a tremendous load in attempting to carry four fifths of the nation's timber, equivalent to nearly sixty years' supply at the present rate of cutting, even allowing for no new growth of merchantable timber in the meantime. Speculation has inevitably characterized the whole enterprise. It was unavoidable because of the uncertain future for lumber. But speculation has practically driven conservative capitalization out of the timber investment field. The result has been that prices as high as \$2.00 to \$2.50 a thousand feet have been actually paid for western timber which in all probability cannot economically be cut for forty or fifty years to come. Many speculators sold out while stumpage prices were high, leaving an over-capitalized fixed investment for later owners to struggle with.

The tradition of the industry has been that "stumpage prices double every ten years." A smaller return is not considered satisfactory. But stumpage prices have not risen materially in the last ten years, and for a time they have declined. Such a situation has played havoc with the expectations of many timber owners. The profitability of investments in standing timber capitalized at billions of dollars is at stake. Big holdings are being cut up into smaller units more suitable for operating. Small holdings are usually too small to support an operation, and, as has been seen, are therefore withheld from the saw, the holder having practically no alternative. This whole situation which promises to fasten itself upon the industry is the chief reason why "price" has failed recently, in large measure, to be the regulator of the holding, or withholding, policy of timber owners.

VII

Another important factor apparently not considered by Professor Stephens, which has largely determined the character and extent of withholding of timber irrespective of the centralization or decentralization of holding, is the relative "accessibility," in the economic sense, of different stands of timber. This factor includes (1) cheapness of access of transportation facilities, (2) nearness to market, (3) topography, (4) density of stand, (5) quality of timber, etc. In the nature of things most of the timber now standing must be withheld from the saw over a long period. The real question at this point is not whether there is or is not withholding of timber, but whether the timber is being reasonably cut in the order of relative accessibility. The number of

ownerships is so large and the differences in financial strength of owners so great that hard-pressed owners in large numbers are cutting timber that is much less "accessible" than hundreds of billions of feet in other ownerships less hard pressed financially. Nearly half of the capital invested in the operating timber holdings in the West has been borrowed. This is responsible for much of the pressure for early liquidation, since the legal interest must be paid. Payment cannot be postponed simply because prices are low. The lower the prices the more lumber must be cut and sold. Such is the start of the "vicious circle" of prices of which the lumber industry has been often a victim.

That there has been cutting of timber of very unequal "accessibility" is attested by the following comparison drawn from the actual record of 119 representative lumbering operations in 1914. The total cost of logging, it is obvious, covers practically all the differences in operating cost due to differences in "accessibility." In the case mentioned the modal group of logging costs fell between \$3.00 and \$4.50 per thousand feet. But the lowest cost was \$1.62 and the highest \$10.43 per thousand feet.

Much timber is being cut which should not now be cut at all, since it can be sold only at a loss. The prevalence of this situation during certain recent periods has resulted in widespread failures, and in the forced sale of entire holdings at relatively low prices. The resulting bankrupt competition has had its usual effect on conditions in the industry, tending to cause still further recapitalization of investments at lower figures. What is probably needed is a systematic national forest policy, one not respecting ownership lines, but securing the cutting of timber in the order of relative "accessibility." Whether this can be accomplished through private enterprise depends in part upon the education of the public and the further enlightenment of the lumbermen, but in addition it depends upon the fitness of the laws governing industry to promote the accomplishment of this purpose desirable both for the industry and for the public.

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